

CLAIMS

1. A cannula for vascular or tissue procedures, comprising a first tube and a second tube each having a distal and proximal end, the first tube being located coannularly within the second tube thereby defining a passage between the first and second tubes, a hub section located at the proximal end of said first and second tubes, a tip section located at the distal end of said first and second tubes, said hub section including a port for creating a vacuum within said passage through to said tip section, said tip section being formed to surround a portion of tissue and maintain a vacuum pressure thereon.

2. A cannula as claimed in claim 1, wherein the inside diameter of said first tube being sized to fit around an incision created in an artery, vein and/or other tissue.

3. A cannula as claimed in claim 1, wherein the inside diameter of said first tube being sized to permit ingress and egress of a dilator.

4. A cannula as claimed in claim 1, wherein the inside diameter of said first tube being sized to permit ingress and egress of a tissue stapler.

5. A cannula as claimed in claim 1, wherein said first and second tubes being formed of plastic.

6. A cannula as claimed in claim 1, further comprising a plurality of support members to hold said first and second tubes in a fixed relationship with respect to one another.

7. A cannula as claimed in claim 1, further comprising an outer sheath member formed over said second tube and being slidably mounted over said second tube.

8. A cannula as claimed in claim 7, wherein said outer sheath member being located past said distal portion and tapering to a tip section of a dilator, wherein said taper being adapted to hold said tip section of said dilator until said sheath is slid proximally against said second tube.

9. A dilator for dilating an incision site, comprising a tubular member having a distal portion and a proximal portion, said distal portion comprising a tapered tip section having a collapsible portion, said proximal portion including a hub section in communication with said collapsible portion, said proximal portion, distal portion and tubular member being in fluid communication with one another, and a blood indication port to indicate the presence of blood at said tip section.

10. A dilator as claimed in claim 9. wherein said collapsible portion comprising a resiliently deformable section that can be closed in a radial direction, said collapsible portion including an O-ring member that can be actuated by a slidable hub

section located at said proximal end to close said collapsible portion.

11. A dilator as claimed in claim 9, further comprising another tubular member within said tubular member for passage of a guidewire therein to locate an incision site.

12. A dilator as claimed in claim 10, wherein said collapsible portion being collapsible in the radial direction sufficient to permit said tip section to pass within a cannula.

13. A dilator as claimed in claim 10, wherein said collapsible tip section being of larger cross-sectional diameter than said tubular member when said collapsible tip section is not collapsed, and of equal or smaller diameter when said collapsible tip section is closed.

14. A dilator as claimed in claim 10, wherein said tubular member having an outside cross-sectional diameter to fit within a cannula.

15. A tissue stapler for deploying a staple into tissue, comprising a tubular member having a tip section, a trigger, and a connecting rod between said tip section and trigger located within said tubular member, said tip section comprising a staple deploying member located on said tubular member and formed about said tip section, a flange

section located on said connecting rod having a flange member adapted to hold a staple between said flange member and said staple deploying member, said connecting rod and said tip section slidably engaged by said trigger to slid said connecting rod toward said tip section thereby deploying said staple.

16. A stapler as claimed in claim 15, wherein said connecting rod being rotatable within said tubular member, and said flange section being mated with an opening in said staple in one dimension, wherein said staple is placed over said flange member and wherein, upon rotation of said connecting rod, said staple being held against said deploying member by said flange member.

17. A stapler as claimed in claim 16, wherein said flange member having a generally oval shape and said opening in said staple having a mated oval shape.

18. A stapler as claimed in claim 15, wherein said trigger comprises a lever for moving said connecting rod against said tip section.

19. A stapler as claimed in claim 18, wherein said trigger further comprises a spring mechanism between said lever and said connecting rod to hold said connecting rod against said deploying member until movement of said lever.

20. A stapler as claimed in claim 15, wherein said staple comprising a

plurality of tissue engaging prongs that are crimped together at least partially through said tissue by said deploying member.

21. A stapler as claimed in claim 15, wherein said deploying member having a generally parabolic shape.

22. A stapler as claimed in claim 15, wherein said deploying member having a plurality of slidable finger members being actuated by said trigger to slide axially over said connecting rod and flange member to crimp said staple.

23. A method of performing a series of intravascular diagnostic, interventional and/or therapeutic procedures at an incision site comprising the steps of:

following a guide wire down to an artery or vein with a combination dilator within a cannula;

positioning at least a tip portion of the dilator within an artery or vein and indicating that the tip is within an artery or vein by the presence of blood;

applying suction to at least a portion of said cannula and communicating said suction to the walls of the artery or vein, thereby fixing the cannula on said walls;

removing the dilator from within the cannula;

maintaining suction on said cannula to permit said cannula to remain located about said opening within the wall of the artery or vein.

24. A method as claimed in claim 23, further comprising the steps of:
performing intravascular diagnostic, interventional and/or therapeutic procedures using the cannula as a locator to the artery or vein;
stapling or suturing the artery or vein, using the cannula as a locator to the opening within the artery or vein; and
removing said suction and removing said cannula.

25. A staple and a stapler for stapling tissue, said stapler comprising a tubular member having a tip section, a trigger, and a connecting rod between said tip section and trigger located within said tubular member, said tip section comprising a staple crimping member located on said tubular member and formed about said tip section, a flange section located on said connecting rod having a flange member adapted to hold a staple between said flange member and said 'staple crimping member, said connecting rod and said tip section slidably engaged by said trigger to slide said connecting rod toward said tip section thereby crimping said staple; said staple comprising a ring member defining an opening therein, said opening being mated to fit over said flange member in one dimension and a plurality of tissue engaging members located on said ring member to pierce into tissue upon crimping by said stapler.

26. A staple and a stapler as claimed in claim 25, wherein said flange member and said opening having mated shapes.

27. A staple and a stapler as claimed in claim 25, wherein said connecting rod being rotatable within said tubular member, and said flange section being mated with an opening in said staple in one dimension, wherein said staple is placed over said flange member and wherein, upon rotation of said connecting rod, said staple being held against said crimping member by said flange member.

28. A cannula as claimed in claim 1, wherein said first and second tubes being a closed, elongated tubular members and being connected to one another in a fixed coannular relationship by one or more connecting members.

29. A cannula as claimed in claim 1, wherein said second tube being a closed, elongated tubular member and said first tube having a tubular cross section and comprising one or more elongated arcuate segments disposed within said second tube, said arcuate segments being fixed to said second tube by one or more connecting members.

30. A cannula as claimed in claim 29, wherein the space between said second tube and said arcuate segments defining said passage for creating said vacuum.

31. A cannula as claimed in claim 29, wherein said connecting members further defining another second passage in relation to said arcuate segments, said second passage being chosen to permit one or more instruments to pass therethrough.

32. A cannula as claimed in claim 1, wherein said cannula being used for diagnostic, interventional and/or therapeutic procedures.